

*If you are using a printed copy of this procedure, and not the on-screen version, then you **MUST** make sure the dates at the bottom of the printed copy and the on-screen version match. The on-screen version of the Collider-Accelerator Department Procedure is the Official Version. Hard copies of all signed, official, C-A Operating Procedures are available by contacting the ESSHQ Procedures Coordinator, Bldg. 911A*

C-A OPERATIONS PROCEDURES MANUAL

15.3.3.17 13.8KV Circuit Breaker Rack In/Out Procedure

(Booster/AGS Ring Power Supply Systems Group Procedure EP-S-017)

Note: This document was formerly a C-A Group Procedure. The content of the group procedure was reviewed by the Technical Supervisor. All approvals and/or issue dates of the original group procedure are maintained for present use.

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Approved: Signature on File
Collider-Accelerator Department Chairman Date

M. Bannon

Group Procedure EP-S-017

Revision 00

Rack-Out Procedure for the 13.8 KV Circuit Breakers PPE 40 cal/cm2

- I. Siemens MG Set (CB-52M) (Bldg 928)
- II. Bldg. 929 RF Station Circuit Breaker
- III. Booster Main Magnet Power Supply (CB-1B) (Bldg. 930A)
- IV. Westinghouse MG Set
- V. Bldg. 928 2.4 MW Transformer 13.8KV Air Switch

I. For Siemens MG Set CB-52M:

- 1. Siemens Rectifiers are in Stand-by.
- 2. Siemens Exciter is in Stand-by.
- 3. Siemens motor has been brought to a complete stop.
- 4. Call line crew and have CB 911-15 in bldg 603 (Temple Place) opened.
- 5. Install a red tag on CB-911-15 circuit breakers "CLOSE HANDLE".
- 6. Insure the 13.8KV line voltage is no longer present on the line side of CB-52M in the basement of Bldg 928 by monitoring the 13.8KV voltmeters in LE1 Console in the old control room, RK 5090 in the new control room and downstairs right next to CB-52M in RK L13.
- 7. Once the 13.8KV has been verified to be off in step #6, Dress out in the proper PPE and rack out CB-52M. Remove the Kirk Lock key from circuit breaker after it has been racked out and it depends on what your will be doing. If access to the pit area is needed, then place key in Kirk Lock on pit door then go inside and open the generator pit door which will release another Kirk Lock key. This key insert in the Kirk Lock tree in the rear of the generator pit. If no access to the pit is necessary place the key from CB-52M in the lock box located outside the 242 Magnet Room and lock key in box. (Reverse order – insert Kirk key in CB-52M and turn key so circuit breaker can be racked in)
- 8. Reverse the steps above to RK in CB-52M and close the CB-911-15 in Bldg 603
- 9. (Reverse Order- Insert Kirk key in CB-52M and turn key so circuit breaker can be racked in)
- 10. (Reverse Order – Rack in CB-52M)
- 11. (Reverse Order – Remove red tag on close handle of CB-911-15)
- 12. (Reverse Order – have line crew re-close CB-911-15 and check voltmeters in Bldg. 928 for proper 13.8KV line voltage)

II. Bldg. 929 RF 13.8KV Circuit Breakers

1.) Purpose: To rack in or out the RF's Group 13.8KV circuit breakers

When racking in or out any of the RF Groups 13.8KV circuit breakers, it will be necessary for a two man team to perform the task

- A. One RF Technician who is familiar with the equipment and knows which circuit breaker needs to be racked out to make that piece of equipment he is to work on safe to work on. (He will be the safety watch)

- B. One Siemens Operator person who is suited up in a **40 cal/cm²** Fire Retardant Blast-suit and Hood with face shield with safety glasses and ear protection work under the face shield and 15KV high voltage gloves. Also cotton clothing is to be work under the suit. Shirt should be long sleeved (**CAT #4**). (He will do the actual rack in or out of 3.8KV circuit breaker with no line voltage present; the main 13.8KV circuit breaker must be open before any down stream 13.8KV circuit breaker can be racked in or out.)

Note:

The safety watch person should suit up with suit and leather gloves and stay out of the blast area when circuit breaker is being racked in or out.

2.) Procedure:

- A. The RF Tech will open all the 13.8KV RF circuit breakers and also the Main 13.8KV circuit breaker. He will then remove the key from their console so that the Main circuit breaker can not be re-closed while this key is removed. Then both the RF Tech and the Siemens Operator shall go out to the 13.8KV circuit breaker house and open up area using a **UEB-19 key**. The Siemens Operator will then open the cubicle for the Main 13.8KV circuit breaker and verify that the circuit breaker is open. This is visible by looking at the window on breaker which shows the status of the breaker, this should read **“OPEN”**, if it still says closed do not proceed and call Siemens Supervisor or the line-crew. With the Main 13.8KV circuit breaker open this now means there is no line voltage present on any of the down stream 13.8KV circuit breakers.
- B. The Siemens Operator and Safety Watch person shall verify before attempting to rack in or out the 13.8KV circuit breaker that they are indeed in the correct cubicle for the power supply being worked on and that the circuit breaker they are about to rack in or out is indeed in the **“OPEN”** position by looking at the status window of the breaker. Once the circuit breaker is verified **“OPEN”** proceed to either rack in or out depending on what operation you have been asked to perform.
- C. When the 13.8KV circuit breaker is racked out the Kirklock key can then be taken out of the breaker cubicle and the RF Technician can work on his equipment. Lock up the 13.8KV circuit breaker area after you are finished with each operation. Do not leave this area open with no one outside for any reason.
- D. When racking the circuit breaker back in, the 2 person team must be used again, the key must be put back into the Kirklock of the circuit breaker where it was removed from. The Kirklock key must be turned so it will not prevent the circuit breaker from being racked in. Then follow Steps A and B making sure you are wearing your 40 CAL/CM/2 blast suite before racking any circuit breaker back into its cubicle.

DO NOT OPERATE

TECHNICIANS

ARE IN PROCESS

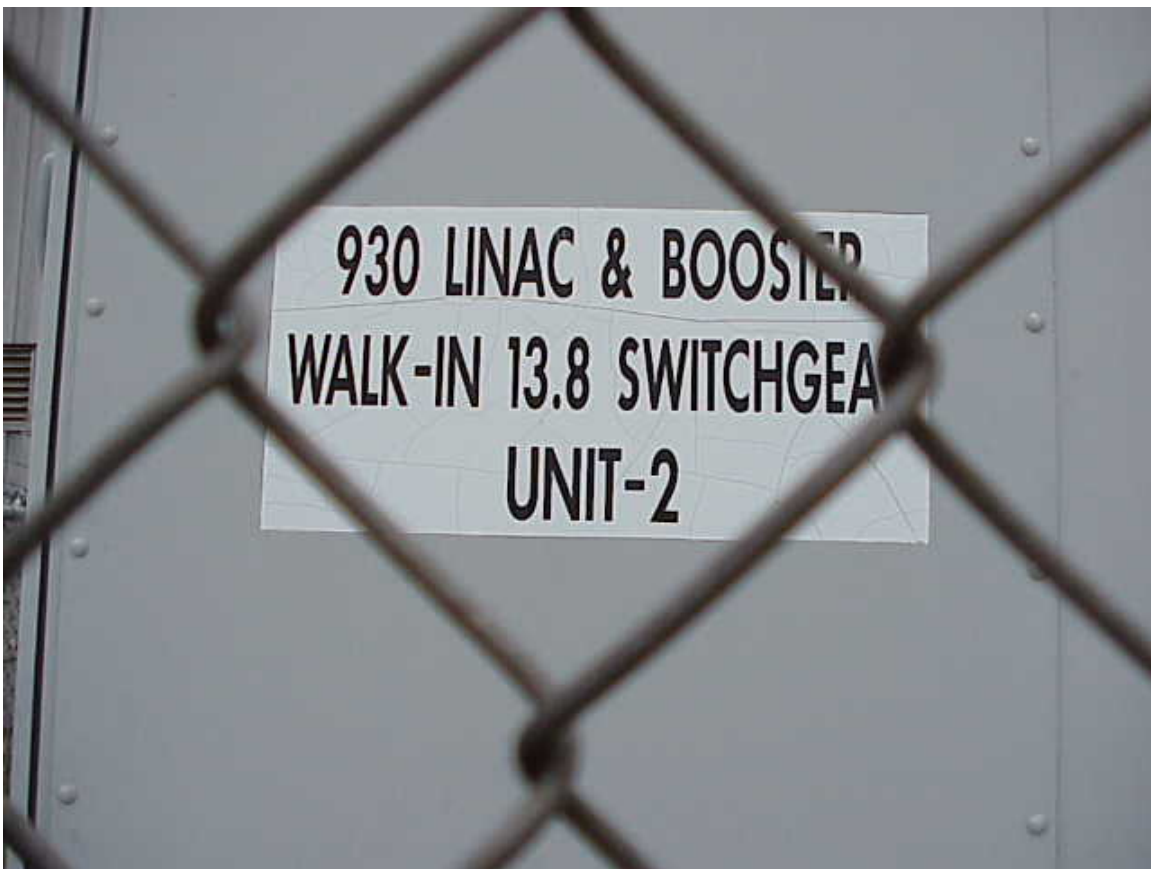
OF RACKING OUT

13.8 KV

CIRCUIT BREAKER

III. BOOSTER MAIN MAGNET POWER SUPPLY 13.8 KV CIRCUIT BREAKER-1B IN BLDG 930A CIRCUIT BREAKER HOUSE

- 1.) As of Oct. 2006, until further notice we want the line crew to open the 13.8kvac 3 ph fused air switch located diagonally from our circuit breaker house next to Bldg 930 (**930 Linac & Booster Walk-In 13.8 Switchgear Unit – 2--Switch “K”**) Note: the BMMPS (Booster Main Magnet Power Supply) must be off and all 7 of the 13.8kv BMMPS circuit breakers opened before the line crew opens Switch “K” in there switchgear. Note, verify that all three phases are reading 13.8KV inside the Booster MMPS CIRCUIT BREAKER House, and then after the line crew opens Switch “K” verify all 3 phases now read zero voltage. Install a lock and tag on Switch “K” until Booster work is completed.



- 2.) With the CB-1B Control Power key is in your possession and the ring grounded. And after the line crew has opened the fused air switch “K”, it is time to go outside to the Booster Circuit Breaker Enclosure Bldg. located inside the fenced area next to the fenced area of the Booster Transformer Yard. A UEB-19 key will be required to enter this area or Transformer Yard Area. (**Note: It will be necessary to wear the proper clothing, blast suit (CAT 4--40 cal/cm2) and high voltage gloves in order to rack out this 13.8kv breaker.**) Once inside the Circuit Breaker Enclosure, go to **CB-1B’s cell** and first verify CB-1B is in the “**OPEN**” position by looking at the flag

on the circuit breaker that shows the status of the breaker (either says open or closed). Once it has been verified the CB-1B is open and the line voltage to CB-1B is zero, suit up properly in CAT 4 -PPE & rack out CB-1B to a “TEST” position by using the manual crank. After it is in a Racked Out to the Test Position, remove the #1 key. Lock the Breaker Enclosure Bldg and fenced area. Go back inside to RK#4941 and insert the #1 key into the “**IB Access Key Tree**”.

IV. Westinghouse Motor Generator 13.8 KV Circuit Breaker in Bldg. 911A

- 1.) Presently nothing has changed. We are to wear 40 cal/cm2 PPE. Open CB-52M from inside control room in Bldg. 911W. After the Westinghouse MG Set has come to a complete stop open the front door of CB-52M and open the knife switch located to the upper right side of the circuit breaker cubicle. Then close the front door and make it is closed and secured properly. Then open the small hatch door located on the bottom right hand side of the front door of CB-52M and insert the circuit breaker crank handle. Press handle in and turn handle counterclockwise to rack out circuit breaker. Reverse this procedure to rack circuit breaker in.
- 2.) Make every effort to rack this CB-52M in and out using the access hole through the front door. With this door closed there is much more protection between you and a possible arc-flash should the circuit breaker fail when you are racking it either in or out.

V. Siemens Bldg 928 2.4 MW 13.8KV Air Switch

- 1.) Presently nothing has changed. We are to wear 40 cal/cm2 PPE. To open the 13.8 KV Air Switch for the 2.4MW Transformer located in the old RF Sub-Yard.